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EXAMINER	
PHAM, CHRYSTINE	
ART UNIT	**PAPER NUMBER**
2122	

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/025,270	SYME ET AL.	
	Examiner	Art Unit	
	Chrystine Pham	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *18 December 2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 7-9, 15-22, 25-31, 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Viroli and Natali of record, hereinafter, *Viroli et al.*.

Claim 1

Viroli et al. teach **a computer program product encoding a computer program** (e.g., see Abstract for homogeneous translation, Core Reflection of Java) **for executing on a computer system a computer process** (i.e., method) (e.g., see page 6 last par. for *RM* translation & associated text) **for dynamically generating typing context data** (i.e., resource type descriptor) (e.g., see page 6 last par. for object t and type descriptors; see FIG.4 & associated text; see page 8 first par. for type descriptor D & associated text) **associated with a typing-context-relevant-code-point being executed within a typing context in a dynamic execution environment** (e.g., see page 6 last par. before section 3 for homogeneous translation & run-time, see page 1st & 2nd par. for RM, instantiations of parametric classes & associated text; see page 11 first par. under section 4.1 for instantiation of a parametric type, run-time & associated text), **the computer process comprising:**

- **a read module for encountering the typing-context-relevant-code-point in the typing context during execution of the program** (e.g., see page 6 last par. for RM translation, type operation & associated text);
- **a handle module for identifying a typing context handle associated with the typing context** (e.g., see page 6 last par. for appropriate method of t; see page 12 1st par. under section 4.2 for $TDManager &

associated text), **the typing context handle referencing a typing context data structure containing a plurality of fields** (i.e., global hash table) (e.g., see page 11 3rd par. for Hashtable, $TD objects & associated text) **associated with the typing context;**

- **a computation module for computing the typing context data associated with the typing-context-relevant-code-point** (e.g., see page 6 last par. for *RM* translation & associated text, see page 6 last par. for object t and type descriptors; see FIG.4 & associated text; see page 8 first par. for type descriptor D & associated text; see page 6 last par. before section 3 for homogeneous translation & run-time, see page 1st & 2nd par. for RM, instantiations of parametric classes & associated text; see page 11 first par. under section 4.1 for instantiation of a parametric type, run-time & associated text);
- **an allocation module for allocating a field** (i.e., index) **in the typing context data structure** (i.e., global hash table) **associated with the typing-context-relevant-code-point in response to identifying operation during execution of the program** (e.g., see page 11 3rd par. under section 4.1 for unique identifier & associated text); and
- **a recording module for recording the typing context data associated with the typing-context-relevant-code-point in the field of the typing context data structure** (e.g., see page 11 2nd & 3rd par. under section 4.1 for Hashtable, $TD objects & associated text).

Claim 2

The rejection of base claim 1 is incorporated. *Viroli et al.* further teach **wherein the typing-context-relevant-code-point executes a type test** (i.e., open-type expression) **on an instance of a generic class** (e.g., page 8 first par. for $Type.instanceOf method & associated text)**, the typing context data includes a resource type descriptor defining the exact type of the instance** (e.g., see page 8 Figure 4 for Class type, $Type[] ar & associated text; see page 11 first par. under section 4.1 for instantiation of a parametric type, see also $TDManager & associated text; see page 11 3rd par. under section 4.1 for Cell<Integer>, Integer.class, type descriptor & associated text), **and the computer process further comprises:**

- **performing the type test based on the resource type descriptor associated with the typing-context-relevant-code-point** (e.g., see page 8 Figure 4 for Class type, $Type[] ar, & associated text).

Claim 3

The rejection of base claim 1 is incorporated. *Viroli et al.* further teach **wherein the typing-context-relevant-code-point executes an allocation of an instance** (i.e., open-type expression) (e.g., see page 6 last par. for object O & associated text) **of a generic class** (e.g., see page 6 last par. for parametric class A<T> & associated text), **the typing context data includes a resource type descriptor defining the exact type of the instance** (see claim 2), **and the computer process further comprises:**

- **creating the instance of the generic class based on the resource type descriptor associated with the typing-context-relevant-code-point, wherein the instance is of the exact type** (e.g., see page 11 first par. under section 4.1 for instantiation of a parametric type, see also $TDManager & associated text; see page 11 3rd par. under section 4.1 for type descriptor, unique identifier & associated text; see page 12 2nd bullet under last par. for Pair<Integer,String>, Pair.createTD & associated text).

Claim 4

The rejection of base claim 1 is incorporated. *Viroli et al.* further teach **wherein the typing-context-relevant-code-point calls a generic method, the typing context data includes another typing context handle, and the computer process further comprises: passing the other typing context handle referencing the typing context data to the generic method as a hidden parameter** (e.g., see page 12 1st par. for method createTD & associated text).

Claim 5

The rejection of base claim 1 is incorporated. *Viroli et al.* further teach **retrieving the typing context handle from a stack frame** (e.g., see Abstract for Java, Virtual Machines).

Claim 7

The rejection of base claim 1 is incorporated. *Viroli et al.* further teach **wherein the computing operation comprises: retrieving/accessing the typing context data associated with the typing-context-relevant-code-point from a global hash table** (i.e., identifying an index associated with the typing-context-relevant-code-point) (e.g., see page 11 3rd par. under section 4.1 for type descriptor, unique identifier & associated text).

Claim 8

The rejection of base claim 1 is incorporated. *Viroli et al.* further teach wherein **the encountering operation comprises: assigning an index to the typing-context-relevant-code-point during execution of the program** (e.g., see page 11 3rd par. under section 4.1 for unique identifier & associated text).

Claim 9

Claim recites limitations, which have been addressed in claim 1, therefore, is rejected for the same reasons as cited in claim 1.

Claims 15-20

Claims recite limitations which have been addressed in claims 1-3, 7, 8, therefore, are rejected for the same reasons as cited in claims 1-3, 7, 8.

Claim 21

The rejection of base claim 15 is incorporated. *Viroli et al.* further teach **wherein the encountering operation comprises: encountering the open-type expression within a scope of an instance of a generic class** (e.g., see page 15 3rd par. under section 4.3 for instance tests, subtyping & associated text).

Claim 22

The rejection of base claim 15 is incorporated. *Viroli et al.* further teach **wherein the typing context is defined within the scope of a stack frame and the operation of identifying a typing context handle comprises: reading the typing context handle from the stack frame** (e.g., see Abstract for Java, Virtual Machines).

Claims 25-31, 33

Claims recite limitations, which have been addressed in claims 1-5, 7, therefore, are rejected for the same reasons as cited in claims 1-5, 7.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 6, 10-14, 23, 24, 32, 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Viroli et al.* in view of Coplien et al. (US 5093914), hereinafter, *Coplien et al.*.

Claim 6

The rejection of base claim 1 is incorporated. *Viroli et al.* further **teaches wherein the typing-context-relevant-code-point is executed within an instance of a generic class** (see claim 21). *Viroli et al.* do not expressly disclose and the identifying operation comprises: retrieving a first pointer to the instance; and retrieving the typing context handle via a second pointer, a second pointer being relative to the first point and referencing the typing context handle associated with the instance. However, *Coplien et al.* teach

- **retrieving a first pointer to the instance** (e.g., see window1 col.10:19-21); and
- **retrieving the typing context handle via a second** (i.e., "this") **pointer** (e.g., see draw(aGenericWindow → draw("hello world"); col.10:26-29, see _Othis col.15:58-68), **a**

second pointer being relative to the first point and referencing the typing context handle associated with the instance (e.g., see zurbitz(window1); col.10:32-35).

Coplien et al. and *Viroli et al.* are analogous art because they are both directed to executing parameterized polymorphic code. It would have been obvious to one of ordinary skill in the pertinent art at the time the invention was made to incorporate the teaching of *Coplien et al.* into that of *Viroli et al.* for the inclusion of first and second pointers. And the motivation for doing so would have been to facilitate sharing of base or generic code (i.e., zurbitz(Window)) by specific type instances or subclasses (e.g., SunviewWindow, XWindow) deriving from the same generic or base class or object (e.g., Window), thus, eliminating redundant code in subclasses which prefer the default semantics defined in the base class.

Claim 10

The rejection of base claim 8 is incorporated. *Viroli et al.* do not expressly disclose wherein the index is assigned based on the "arity" of the typing-context-relevant-code-point. However, *Coplien et al.* teach **wherein the index is assigned based on the "arity"** (i.e., category) **of the typing-context-relevant-code-point** (e.g., see index, function f, no arguments col.12:35-42). It would have been obvious to one of ordinary skill in the pertinent art at the time the invention was made to incorporate the teaching of *Coplien et al.* into that of *Viroli et al.* for the inclusion of assigning index based on the "arity". And the motivation for doing so would have been to facilitate the construction of function signatures (each consists of a function name and the number of arguments) for the purpose of organizing and identifying liked named functions that have different argument lists.

Claim 11

The rejection of base claim 8 is incorporated. Claim recites limitations, which have been addressed in claim 10, therefore, is rejected for the same reasons as cited in claim 10.

Claim 12

The rejection of base claim 11 is incorporated. *Coplien et al.* further teach **wherein the category is assigned on a per-containing class basis** (e.g., see Xwindow Object, SunviewWindow Object FIG.7 & associated text).

Claim 13

The rejection of base claim 11 is incorporated. *Coplien et al.* further teach **wherein the category is assigned on a per-containing method basis** (e.g., see Xwindow::draw, SunviewWindow::draw FIG.7 & associated text).

Claim 14

The rejection of base claim 11 is incorporated. *Coplien et al.* further teach **wherein the category is assigned on a per-containing assembly basis** (e.g., see Window::move() FIG.7 & associated text).

Claim 23

The rejection of base claim 15 is incorporated. Claim recites limitations, which have been addressed in claim 6, therefore, is rejected for the same reasons as cited in claim 6.

Claim 24

The rejection of base claim 15 is incorporated. *Viroli et al.* do not expressly disclose wherein the typing context data structure is appended to a virtual table associated with the generic class. However, *Coplien et al.* teach **computer readable medium containing typing context data structure which is appended to a virtual table** (e.g., see DISK 200 FIG.1 & associated text, see Vtbl FIG.8 & associated text) **associated with the generic class** (e.g., see virtual function table, base type col.3:32-38). It would have been obvious to one of ordinary skill in the pertinent art at the time the invention was made to incorporate the teaching of *Coplien et al.* into that of *Viroli et al.* for the inclusion of the virtual table. And the motivation for doing so

would have been to facilitate the mapping of virtual functions to their corresponding addresses for data accessing and handling (e.g., setting breakpoints in virtual functions).

Claim 32

The rejection of base claim 27 is incorporated. Claim recites limitations which have been addressed in claim 6, therefore, is rejected for the same reasons as cited in claim 6.

Claims 34-36

Claims recite limitations which have been addressed in claims 1, 2, 7, 24, therefore, are rejected for the same reasons as cited in claims 1, 2, 7, 24.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:
   - Systems and methods and implementing exception handling using exception registration records stored in stack memory, Kukol (US 5628016)
   - Type error checker for type-free or polymorphic computer language, Sato (US 5748966)
   - Method and apparatus for the development of dynamically configurable software systems, Freed et al. (US 6269473)

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chrystine Pham whose telephone number is 571.212.3702. The examiner can normally be reached on Mon-Fri, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q Dam can be reached on 571.272.3695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chrystine Pham
Examiner
GAU 2122

WEI Y. ZHEN
PRIMARY EXAMINER